





NOTE: CONSTRUCTION JOINT KEY OMITTED FOR CLARITY.

GENERAL NOTES:

ALL DIMENSIONS SHOWN ARE IN INCH UNLESS OTHERWISE NOTED.

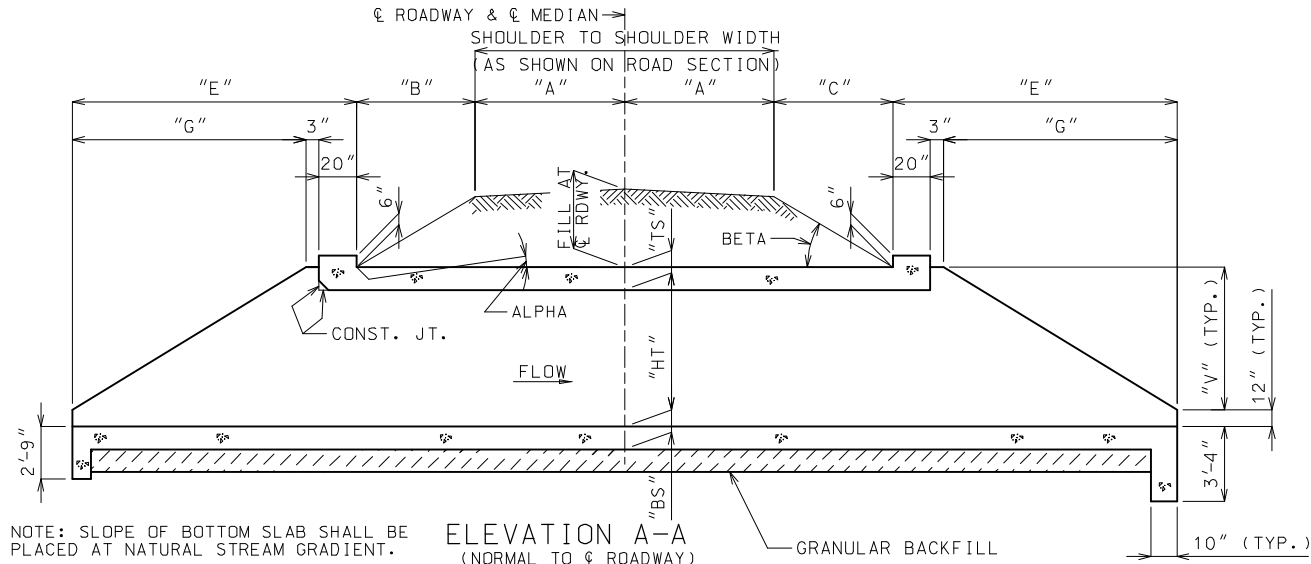
J1 BARS MAY BE BENT IN FIELD OR SHOP.

MINIMUM CLEARANCE TO REINFORCING STEEL SHALL BE 1-1/2"  
UNLESS OTHERWISE SHOWN.

FOR DIMENSIONS AND SIZE AND SPACING OF REINFORCING STEEL,  
SEE STANDARD SHEET 703.15.

- ① FOR DETAILS OF REINFORCEMENT IN WINGS, SEE STANDARD SHEET 703.37.

MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION			
	CONCRETE SINGLE BOX STRUCTURE STRAIGHT WINGS ( SQUARE )		
DATE: _____	EFFECTIVE: 09-01-2006	703.10G	2 3



NOTE: SLOPE OF BOTTOM SLAB SHALL BE PLACED AT NATURAL STREAM GRADIENT.

ELEVATION A-A  
(NORMAL TO CL ROADWAY)

IF UNSUITABLE MATERIAL IS ENCOUNTERED, EXCAVATION OF UNSUITABLE MATERIAL AND FURNISHING AND PLACING OF GRANULAR BACKFILL SHALL BE IN ACCORDANCE WITH SEC. 206.

GENERAL DATA TABLE	
VARIABLE	DIMENSION (in.)
ALPHA	SEE EQUATIONS
BETA	SEE EQUATIONS
"B"	SEE EQUATIONS
"C"	SEE EQUATIONS
"E"	$G + 23"$
"F"	$S + 2TX$
"G"	$2V$
"L"	$2A + B + C + 2E$
"V"	$HT + TS - 12"$

### GENERAL NOTES:

#### DESIGN SPECIFICATIONS:

AASHTO - 2002  
LOAD FACTOR DESIGN

#### DESIGN UNIT STRESSES:

CLASS B-1 CONCRETE  $f'_c = 4,000 \text{ psi}$   
REINFORCING STEEL (GRADE 60),  
 $f_y = 60,000 \text{ psi}$

#### DESIGN LOADING:

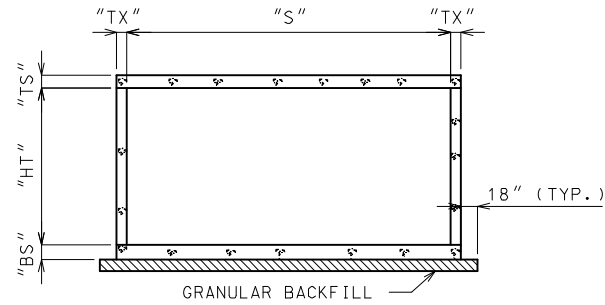
EARTH  $120 \text{ #/ft.}^3$   
EQUIVALENT FLUID PRESSURE  
 $30 \text{ #/ft.}^3$  (MIN.) -  $60 \text{ #/ft.}^3$  (MAX.)

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(in.) UNLESS OTHERWISE NOTED.

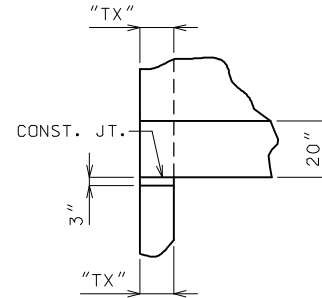
THIS DRAWING IS NOT TO SCALE.  
FOLLOW DIMENSIONS.

FOR DIMENSIONS NOT SHOWN, SEE  
STANDARD SHEETS 703.10, SHEETS  
1 & 2 OF 3 OR 703.15.

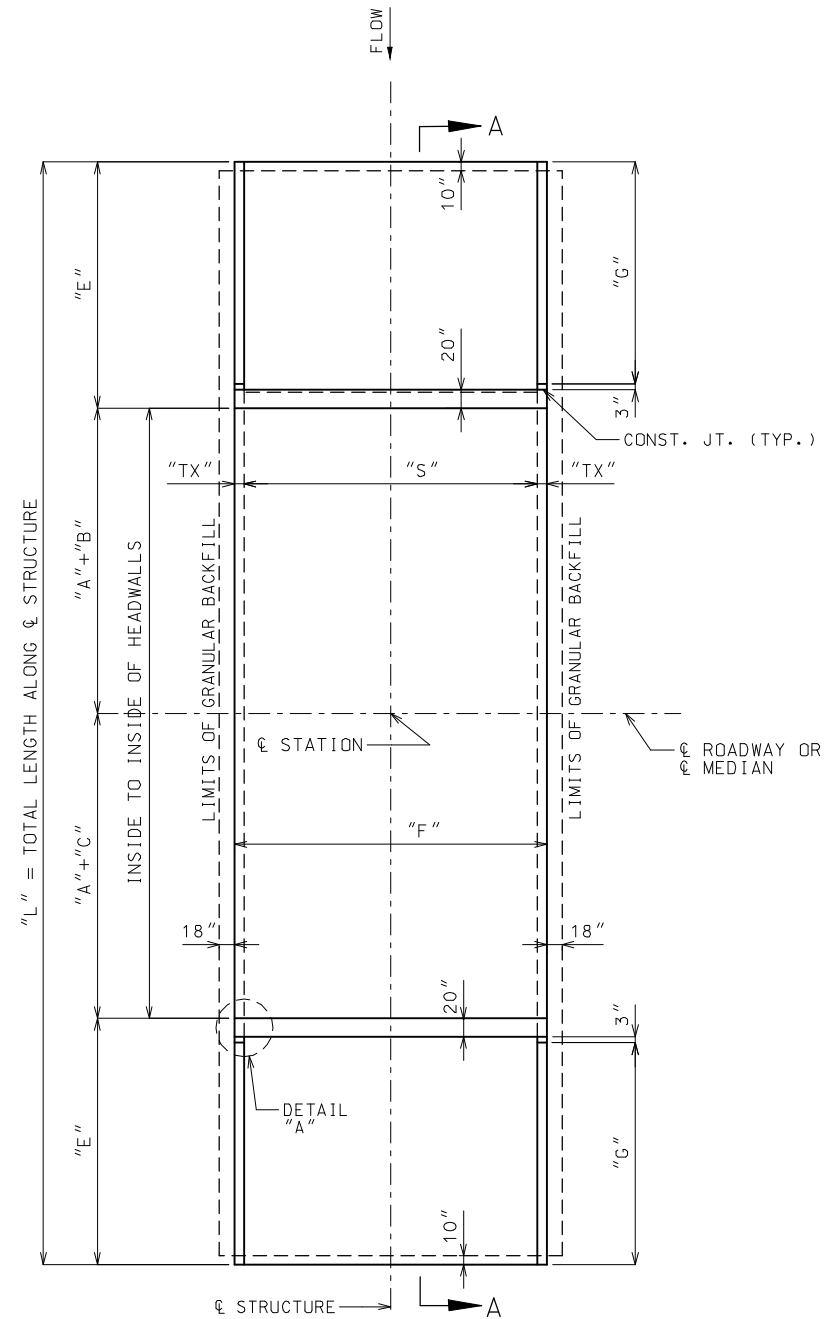
NOTE:  
WHEN ALTERNATE PRECAST BOX SECTIONS ARE USED, THE MINIMUM BARREL  
LENGTH MEASURED ALONG THE SHORTEST WALL FROM THE FIRST JOINT TO  
THE OUTSIDE OF THE HEADWALL SHALL BE 3'-2". REINFORCEMENT AND  
DIMENSIONS FOR THE WINGS AND HEADWALLS SHALL BE IN ACCORDANCE WITH  
MISSOURI STANDARD PLANS DRAWINGS.



SECTION THRU BOX  
(NORMAL TO CL STRUCTURE)



DETAIL "A"



PLAN SHOWING LAYOUT DIMENSIONS

### EQUATIONS FOR COMPUTING LENGTH OF BARRELS

LET ALPHA = ANGLE OF SLOPE OF BARREL WITH HORIZONTAL ALONG  
CL OF CULVERT.

LET BETA = ANGLE OF SLOPE OF FILL NORMAL TO CL ROADWAY.

"B" OR "C" =  $\frac{(\text{FILL AT CL ROADWAY}) \pm (\text{CROSS-SLOPE}) \times "A" \pm A \tan(\text{ALPHA})}{\tan(\text{BETA}) \pm \tan(\text{ALPHA})}$

"B" OR "C" = HORIZONTAL DISTANCE FROM EDGE OF SHOULDER TO  
HEADWALL NORMAL TO CL OF ROADWAY.

### DEFINITIONS

CROSS-SLOPE: SLOPE OF EACH PART OF THE ROADWAY INCLUDING  
ROADWAY CROWN, SHOULDER SLOPE, AND/OR SUPERELEVATION.  
SEE DESIGN ROADWAY CROSS SECTION FOR LANE AND SHOULDER  
WIDTHS AND SLOPES.

### MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION

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